Claims

- 1. A method for detecting the differentiation status of stem cells comprising detecting the expression of 5T4 antigen in said stem cells.
 - 2. A method as claimed in claim 1 wherein a low level of 5T4 antigen expression indicates undifferentiated or pluripotent stem cells.
- 10 3. A method as claimed in claim 2 wherein said stem cells are mammalian stem cells.
 - 4. A method as claimed in claim 3 wherein said stem cells are embryonic stem cells.
- 5. A method as claimed in claim 2 or 3 wherein said stem cells are murine, human, primate porcine, feline, bovine, ovine or canine.
 - 6. A method as claimed in any of claims 2 to 5 wherein said 5T4 expression is detected by anti-5T4 antibodies.
- 7. A method as claimed in any of claims 2 to 5 wherein said 5T4 expression is detected by expression of a reporter gene wherein said reporter gene is under control of the 5T4 promoter.
- 8. A method of detecting differentiation status of a population of mammalian stem cells comprising the steps of:
 - a) taking a sample of cells from said population of mammalian stem cells;
 - b) incubating said sample with a labelled anti-5T4 antibody such that specific binding of anti-5T4 antibody to 5T4 antigen occurs; and
- c) detecting said binding of said antibody wherein binding of the anti-5T4 antibody to cells
 in the sample is indicative of the presence of 5T4 and differentiated stem cells.
 - 9. A method for separating a population of undifferentiated or differentiated mammalian stem cells from a mixture of differentiated and undifferentiated stem cells comprising:
 - a) binding cells with anti-5T4 antibody;

- b) separating cells with bound antibody from cells with no bound antibody; and
- c) isolating the cells.
- 5 10.A method as claimed in claim 9wherein said isolated cells are viable.
 - 11. A method for testing growth media for its use in maintaining mammalian stem cells comprising detecting expression of 5T4 comprising the steps of:
 - a) taking mammalian stem cells in culture:
- b) applying test media; and
 - c) assessing 5T4 expression in the absence or presence of said media wherein the presence of 5T4 is an indication of stem cells undergoing differentiation.
- 12.A method for detecting the ability of a test compound to induce mammalian stem cell differentiation comprising the steps of:
 - a) incubating a mammalian stem cell culture in the presence or absence of said test compound;
 - b) detecting 5T4 expression; and

25

- c) comparing the levels of 5T4 expression in cells wherein increased 5T4 expression in those
 cells incubated in the presence of said test compound indicates differentiation induction by said test compound.
 - 13. A method as claimed in claims 11 or 12 wherein 5T4 expression is detected by expression of a reporter gene wherein said reporter gene is under control of the 5T4 promoter.
 - 14. Use of an antibody recognising 5T4 in a method of detecting differentiated mammalian cells.
- 15. Use of an antibody recognising 5T4 in a method of testing growth media for its use in maintaining mammalian stem cells.
 - 16. A method for detecting differentiation status of a mammalian stem cell comprising:
 - a) introducing into a stem cell a vector comprising a 5T4 promoter sequence operably linked to a nucleic acid encoding a reporter gene;

- b) detecting an increase in expression of the reporter gene as an indication of differentiation.
- 17. A method as claimed in claim 16 wherein the vector comprising 5T4 promoter sequence is a targeting construct for homologous recombination.
 - 18. A method of modifying a mammalian stem cell comprising introducing a nucleic acid sequence into a mammalian cell such that said nucleic acid sequence is placed under the control of the 5T4 promoter sequence.

10

- 19. A method of modulating mammalian stem cell differentiation comprising modulating 5T4 expression or functional activity.
- 20.Use of an agent that modulates 5T4 expression or functional activity in the modulation of mammalian stem cell differentiation.